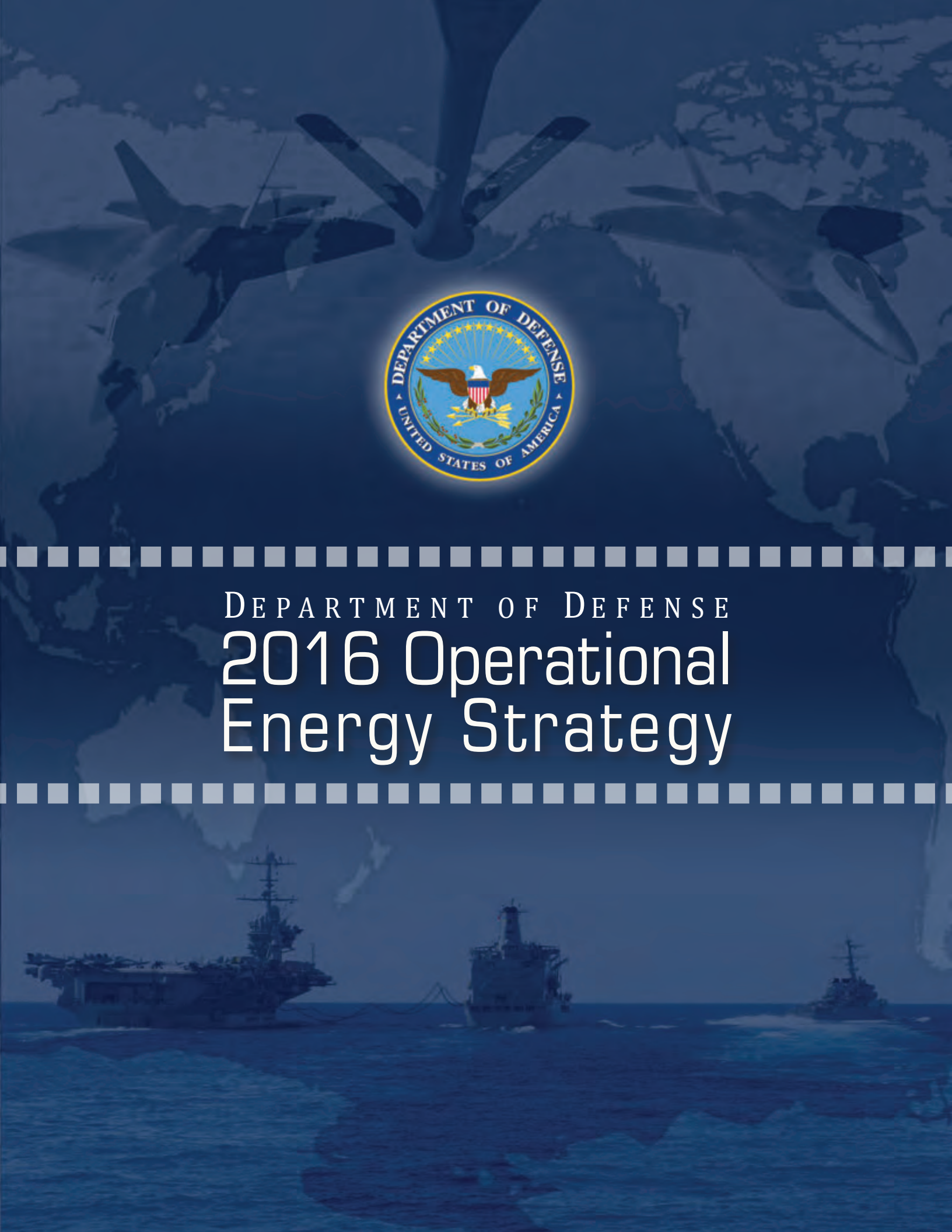

DEPARTMENT OF DEFENSE

2016 Operational Energy Strategy

Cover image front: A KC-135 Stratotanker from the Alaska Air National Guard 168th Air Refueling Wing waits as two F-22 Raptors from the 90th Fighter Squadron at Elmendorf Air Force Base fly in for refueling. With the KC-135's mission of air refueling, the F-22 capabilities can accomplish its mission of global engagement (U.S. Air Force photo by Airman 1st Class Jonathan Steffen)

Cover image bottom: The guided missile destroyer USS Gonzalez (DDG 66) breaks away during a replenishment-at-sea with the Military Sealift Command fleet replenishment oiler USNS Kanawha (T-AO 196) and the aircraft carrier USS Harry S. Truman (CVN 75) (U.S. Navy photo by MC3 Michael J. Lieberknecht)

The estimated cost of this report or study for the Department of Defense is approximately $78,000 in Fiscal Years 2015-2016. This includes $25,000 in expenses and $54,000 in DoD labor.
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INTRODUCTION

This document sets forth an updated *Operational Energy Strategy* for the U.S. Department of Defense (DoD), as required by law and first issued in 2011[1]. This updated strategy recognizes the crucial role of energy in enabling our forces to perform worldwide missions, while also acknowledging energy as a potential vulnerability.


USMC CH-53E Super Stallion takes off

Energy is a fundamental enabler of military capability, and the ability of the United States to project and sustain the power necessary for defense depends on the assured delivery of this energy. It must be available at home and abroad, over great distances, through adverse weather, and across air, land, and sea, often against determined adversaries.


Underway replenishment during RIMPAC 2012

As defined in law, operational energy is the "energy required for training, moving, and sustaining military forces and weapons platforms for military operations."[2] This term includes energy used by tactical power systems and generators, as well as by weapons platforms themselves. The Department considers operational energy to be the energy used in military operations, in direct support of military operations, and in training that supports unit readiness for military operations, to include the energy used at non-enduring locations (contingency bases). Traditionally, the scope of operational energy excludes nuclear energy used for the propulsion of the U.S. Navy's aircraft carriers and submarines, as well as the energy used for military space launch and operations.[3] The mission, design, and physics mean that these systems, by their nature, avoid many of the challenges associated with resupplying other military air, sea, and land capabilities with liquid fuel. The Department relies on the extensive expertise of the Navy and Air Force in these areas to ensure these separate domains execute in a safe and effective manner that accounts for their unique energy requirements.

Operational energy is the energy required for training, moving, and sustaining military forces and weapons platforms for military operations.


Army Strykers exercise on Hawaii's Big Island


USAF F-22s from Elmendorf AFB, Alaska

[1] 10 US Code § 2926(b)
[2] 10 US Code § 2924
[3] Operational energy does include the energy needed to operate the embarked aircraft and helicopters.

Balancing out the Department's energy portfolio is installation energy, which is the energy used to power installations and enduring locations, as well as the non-tactical fleet vehicles used at those locations. In many ways, installation energy supports warfighter requirements through secure and resilient sources of commercial electrical energy, and where applicable, energy generation and storage, to support mission loads, power projection platforms, remotely piloted aircraft operations, intelligence support, and cyber operations. There are a range of initiatives outside the scope of this strategy that support installation energy resiliency and cyber security of related industrial control systems.

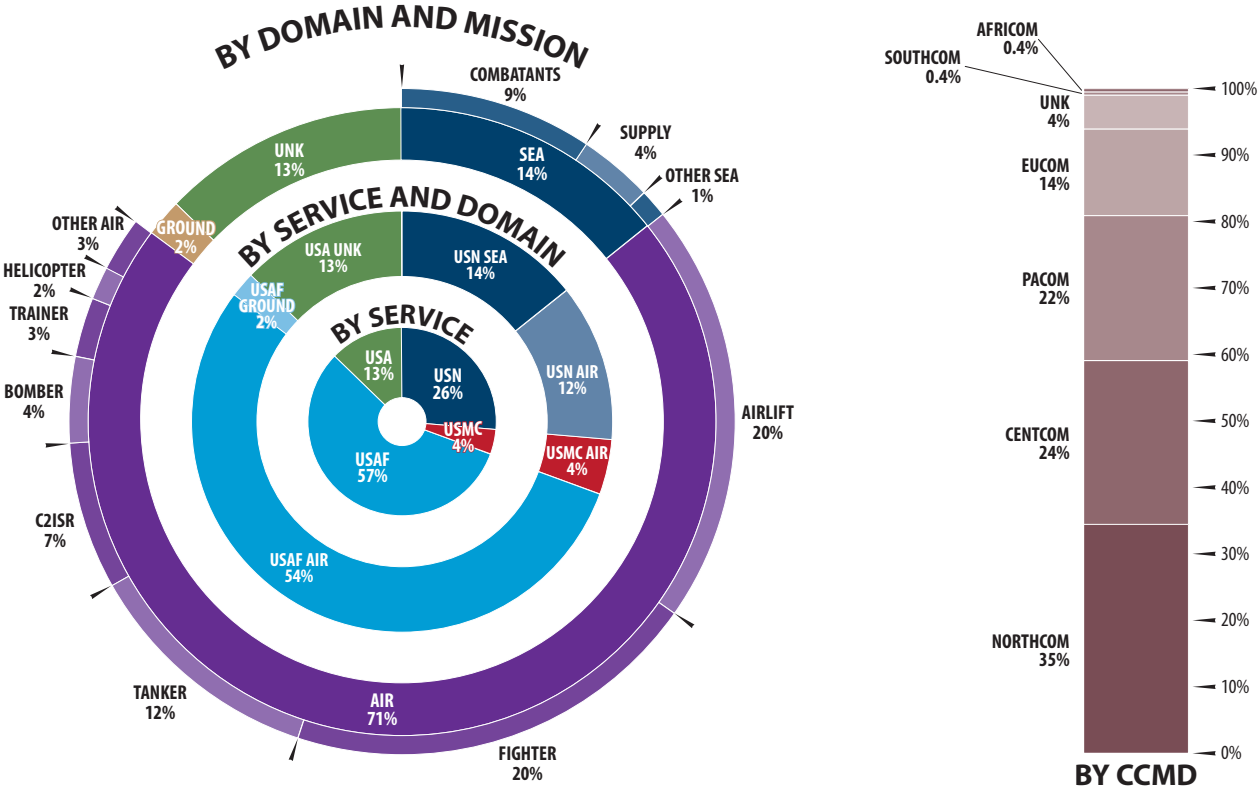


Figure 1: Operational Energy Use, FY 2014

In fiscal year (FY) 2014, DoD consumed 87.4 million barrels of fuel enterprise-wide to deploy and sustain worldwide missions. This fuel supported operations in Afghanistan, Africa, and Iraq, as well as the Department's global presence, training at home and overseas, and logistical resupply. Figure 1 illustrates the Department's use of fuel to train, move, and sustain military forces and weapons platforms in FY 2014. Overall, the Department's operational energy demand has grown tremendously since FY 2000, peaking in FY 2007, and then declining by 30 percent from that peak in FY 2014. While many of these changes in energy use can be attributed to operational tempo in U.S. Central Command (USCENTCOM), the Department's weapons platforms and equipment also are demanding more energy, albeit with ever increasing combat capability. The Department's operational

energy use is dominated by air and sea platforms in the Air Force and Navy; the Air Force uses roughly half of the fuel consumed by DoD, and the Navy consumes about one third.

Campaign analyses, wargames, and decades of operational experience have demonstrated the tradeoffs and risks that accompany the need for such large amounts of energy. The 2011 *Operational Energy Strategy* began addressing these risks by focusing Department efforts on reducing the demand for energy, expanding and securing the supply of energy, and building energy security into the future force. However, significant changes within the Department and the operational environment now suggest the need to revise our approach to both new and enduring challenges.

For instance, the Department's efforts to rebalance to the Asia-Pacific region, as articulated in the 2014 *Quadrennial Defense Review* (QDR), will further increase the demand for fuel as operations must be conducted across vast distances. While taking advantage of the lessons learned regarding logistics risks and vulnerabilities in Afghanistan, the Department also needs to fully understand and mitigate a different set of risks posed by operating in the Pacific theater. Moreover, next generation weapons platforms and concepts of operation often use more energy than their predecessors. As a result, risks to the logistical underpinnings of U.S. power projection, particularly the availability of operational energy, are an enduring challenge.

"We will continue our contributions to the U.S. rebalance to the Asia-Pacific region…"

"The Department has invested in energy efficiency, new technologies, and renewable energy sources to make us a stronger and more effective fighting force."

"Energy improvements enhance range, endurance, and agility, particularly in the future security environment where logistics may be constrained."

While rising U.S. production of oil and gas and decreasing oil imports may bolster the Nation's energy security and economic performance, the Department continues to operate far from the U.S., using refined energy products purchased as close as possible to the point of use. In fact, as long as the U.S. exercises global leadership in support of our interests, the large volumes of energy needed to enable supporting military capabilities will continue to be purchased overseas and impose risks to the Department.

In response to these challenges, the 2016 *Operational Energy Strategy* takes advantage of improved technology and the Department's steadily improving understanding of

operational energy challenges to ensure the consistent delivery of energy to the warfighter. Specifically, the Department will pursue the following objectives:

- Increase future warfighting capability by including energy throughout future force development.
- Identify and reduce logistics and operational risks from operational energy vulnerabilities.
- Enhance the mission effectiveness of the current force through updated equipment and improvements in training, exercises, and operations.

The 2016 *Operational Energy Strategy* sets the overall direction for the Office of the Secretary of Defense (OSD), Combatant Commands (CCMDs), Defense Agencies, and Military Departments/Services (hereinafter "DoD Components") and includes cascading goals, targets, and offices of primary responsibility accountable for making progress against these three objectives. The Assistant Secretary of Defense for Energy, Installations, and Environment (ASD(EI&E)) is responsible for the overall implementation of the strategy.[4]

The Department will use the Defense Operational Energy Board (DOEB), co-chaired by the ASD(EI&E) and the Joint Staff/Director for Logistics (JS/J4), and the annual Planning, Programming, Budgeting, Execution (PPBE) process to prioritize, coordinate, and review activities aligned to the strategy's objectives and goals.[5]

[4] Formerly the Assistant Secretary of Defense for Operational Energy Plans and Programs (ASD(OEPP)). In FY 2015, the offices of ASD(OEPP) and Deputy Under Secretary of Defense for Installations and Environment merged to create ASD(EI&E).

[5] Defense Operational Energy Board Charter; http://energy.defense.gov/Portals/25/Documents/Blog/20120322_DOEB_Charter.pdf.

SHAPING A NEW STRATEGY

Since the establishment of the Operational Energy Plans and Programs directorate within the Office of the Under Secretary of Defense of Acquisition, Technology & Logistics (OUSD(AT&L)) in 2010, the Department has made enormous strides in understanding and responding to the challenges of global power projection and sustainment posed by risks to the energy supply-chain. Overall, the 2011 *Operational Energy Strategy's* purpose of assuring the provision of energy to the warfighter remains vital. However, the evolving operational environment and the Department's experience over the past four years suggested a revised approach to meeting this goal. Specific influences include:

The Rebalance to the Pacific

At the forefront, the Department's focus on the Asia-Pacific region necessitates a second look at operational energy priorities. The 2012 *Defense Strategic Guidance* calls for the Department to "rebalance toward the Asia-Pacific region," and investment, "as required, to ensure its ability to operate effectively in anti-access and area denial (A2/AD) environments."[6] The 2014 QDR reinforced this direction by noting that the Department will "retain and strengthen our power projection capabilities so that we can deter conflict, and if deterrence fails, win decisively against aggressors."[7] The 2015 *National Military Strategy (NMS)* confirms that the Department will "press forward with the rebalance to the Asia-Pacific region, placing our most advanced capabilities and greater capacity in that vital theater."[8] Multiple analyses and wargames suggest that the tyranny

USAF and Navy forces in Valiant Shield 2007 in the Pacific.

Operations in the Pacific will mean a new set of operational energy challenges and opportunities.

[6] 2012 Defense Strategic Guidance, pp 2 and 4-5; http://www.defense.gov/news/Defense_Strategic_Guidance.pdf.

[7] 2014 Quadrennial Defense Review, p 9; http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf

[8] Chairman of the Joint Chiefs of Staff, National Military Strategy of the United States of America 2015, p 9; http://www.jcs.mil/Portals/36/Documents/Publications/2015_National_Military_Strategy.pdf.

of distance will challenge the projection of power into and around the Asia-Pacific region. Additionally, Asia-Pacific operations will rely on energy to power the airbases, ports, and sea bases needed to employ air and sea capabilities. Finally, the Department acknowledges that the integrated air defenses, accurate cruise and ballistic missiles, and cyber threats in the region are distinctly different from those in USCENTCOM or U.S. Africa Command (USAFRICOM), as well as more lethal to the air and sea forces most needed to project and sustain power in Asia-Pacific.[9] These challenges to our energy and logistics networks will need to be addressed by more than reductions in energy demand. Changes in operations and/or logistics capacity may also be needed to increase combat effectiveness and decrease mission risk.

Improved Analytical Capability

Relative to 2011, the Department better understands the implications of energy use in systems, operation plans (OPLANs), and concepts of operation (CONOPS). Specifically, the Department has gained substantial experience using Energy Supportability Analyses (ESAs) to inform the Energy Key Performance Parameter (eKPP) associated with specific military systems. In fact, energy supportability analyses may not only identify the need for changes in the design or energy use of a system, but also changes in CONOPS, force structure, and logistics capacity. The initial strategy was not able to benefit from these technical, conceptual, and analytical improvements, and instead focused on energy demand and supply as well as congressionally mandated changes in the capability development process. Improved fidelity in identifying logistical and operational risk now enables more precision in the prioritization of specific mitigations and responses.

Continued Support of Global Operations

Despite this rebalance to the Asia-Pacific, the United States still maintains enduring interests around the globe. The 2015 *NMS* states that the U.S. military "must provide a full range of military options for addressing both revisionist states and violent extremist organizations (VEOs)."[10] Accordingly, operations against VEOs such as the Islamic State in the Levant (ISIL), al Qaida, and other irregular adversaries are likely to continue. In addition, the Department's presence in Africa will depend on a distributed network of contingency bases designed to enhance partnership capacity, and austere airbases co-

[9] Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2015; http://www.defense.gov/pubs/2015_China_Military_Power_Report.pdf.
[10] 2015 National Military Strategy, p 3.

located with existing airfields. Working with host countries, operational energy will continue to be a vital enabler for these critical military missions. The Department will require the application of the lessons learned in Iraq, Afghanistan, and Africa to ensure that operational energy is available in the right quantities and at the right time to support global operations. The difficulty of the last tactical mile of resupply, improvised explosive devices, irregular adversaries, and insurgent attacks on fuel convoys are likely to remain a part of the operational environment.

Increasing Risks to Operational Energy

Finally, A2/AD and hybrid threats pose escalating risks to the assured delivery of operational energy and, by extension, the ability to project and sustain power worldwide.[11] While more capable in terms of speed, survivability, stealth, payload, and maneuverability, next generation systems often require more energy. The ability of these new systems to meet their performance parameters frequently assumes an assured supply of energy, despite larger operating areas, flat or declining fuel logistics capacity, and increasing threats to energy infrastructure. Exacerbating these risks, emerging concepts often make questionable assumptions regarding combat forces operating at austere bases supported by abundant Joint logistics capacity. In fact, Department analyses acknowledge the risk that – unless demand for energy and logistics is curtailed – these logistically intensive future concepts may not be supportable.[12]

Anti-access/area-denial weapons like mines, ballistic and cruise missiles, advanced air defenses, and improvised explosive devices threaten the assured delivery of energy across air, land, and sea.

Overall, forces for both continuity and change have shaped the development of a new *Operational Energy Strategy*. The resulting objectives and goals are outlined in the next section.

[11] 2015 NMS refers to hybrid warfare on p 4.
[12] Joint Operational Access Concept, Jan 2012, p 37; http://www.defense.gov/pubs/pdfs/JOAC_Jan%202012_Signed.pdf/.

THE 2016 OPERATIONAL ENERGY STRATEGY

The Department recognizes that while reducing the demand for energy is an essential component of any energy strategy, this may not always be an option. Instead, the Department should remain focused on achieving increased warfighter capability as the salient outcome while advocating for programs and initiatives that both reduce energy demand and enhance energy supportability as a means to achieve increased capability. After improvements in capability, the Department should identify and address risks, regardless of the type of mitigation, and use these operational and logistics risks to inform investment priorities. Finally, the Department should expand training and education in energy efficiency and best practices to improve the use of energy in current operations.

Accordingly, the Department will pursue the following objectives in the 2016 *Operational Energy Strategy*:

- Increase future warfighting capability by including energy throughout future force development.
- Identify and reduce logistics and operational risks from operational energy vulnerabilities.
- Enhance mission effectiveness of the current force through updated equipment and improvements in training, exercises, and operations.

Objective 1: Increase Future Warfighting Capability

First and foremost, the Department's use of operational energy needs to focus on increasing long-term warfighting capability.[13] Systems under development need to be evaluated for their effectiveness and supportability in the types of combat scenarios in which they are expected to be used. The Department will improve future combat effectiveness and capability by thoroughly integrating energy supportability into capability development and investing in innovation tailored to an enhanced ability to operate in contested environments.

[13] Long-term or future is defined as affecting the Department's use of energy three or more years after each President's Budget. For the FY 2017 President's Budget, long-term and future includes initiatives fielded in FY 2019 and beyond.

Goal: Institutionalize Energy Supportability Analyses in Capability Development.

Fundamental to improvements in capability is a rigorous and comprehensive assessment of how future systems will be supported and sustained. While recent changes to the Joint Capabilities Integration and Development System (JCIDS) manual have improved Joint Staff oversight of the mandatory use of ESAs and eKPPs, the Department recognizes that these analyses are often conducted on systems long after many critical design tradeoffs have already been made. For systems that are nearing production or post-production, the ESA ensures that logistics risks have been accounted for and that mitigation strategies have been identified.

CH-53K Heavy Lift Helicopter

DDG 112, USS Michael Murphy

The Department has used Energy Supportability Analyses to directly inform the development of the CH-53K helicopter and DDG 51 Flight III destroyer.

Looking ahead, the Department will focus on improving the quality of analytical tools and wargames, and consider including energy supportability analyses in the initial formulation of all new capabilities. Specifically, the Department will consider requiring that operational energy demands and the ability to meet those demands be included in Capabilities-Based Assessments (CBAs) and ESAs prior to developing Energy Key Performance Parameters. With additional knowledge of these inherent energy constraints and risks, the Department will have the ability to make better energy-informed decisions.

Goal: Improve Combat Effectiveness and Supportability through Innovation.

In addition to ESA-informed eKPPs that improve the combat effectiveness and supportability of major acquisition programs, the Department will continue to invest in energy innovation that improves the long-term capability of the Department, such as increasing the range or endurance of platforms. These innovations may include better or new means of propulsion, lightweight and stronger materials, new designs, enhanced payloads and sub-systems, and even directed energy weapons.

To reach this goal, the Department will invest in research to improve long-term capability, enhance the ability to operate in contested environments, and reduce energy logistics

requirements. In accordance with Department guidance, priority will be given to investments that support the rebalance to the Asia- Pacific region. Finally, the Department will prioritize Operational Energy Capability Improvement Fund (OECIF) investments toward capabilities tailored for the Asia-Pacific region.[14] In conjunction with improved decision making for major acquisition programs, these investments in operational energy should, as stated in the 2014 QDR, make the Department "a stronger and more effective fighting force."[15]

Objective 2: Identify and Reduce Logistics and Operational Risks

In partnership with OSD, Joint Staff, CCMDs, and the Military Departments, the Department now has a better, yet still incomplete, understanding of the specific risks associated with energy in operation plans and in concepts of operations. In order to capitalize on the advances made in wargames, modeling, simulation, and other analytical tools, the Department will specifically focus on identifying risks and prioritizing resources for their mitigation.

Goal: Identify and Mitigate Energy Related Risks in Deliberate Planning.

Together, campaign planning and contingency planning comprise the foundation of DoD's deliberate planning activities. Theater Campaign Plans (TCPs) and geographic campaign plans link steady-state shaping activities to current operations and contingency plans, while OPLANs and concept plans (CONPLANs) are critical indicators of "fight tonight" requirements. Taking advantage of existing reporting systems, the Department will continue to improve its understanding of the risks to providing energy to Joint forces carrying out these plans and activities. The Department will examine and enhance its capacity to acquire, store, and move energy in required volumes to the point of use while overcoming realistic threats, including risks across the supply chain.

Army M1 tanks during an exercise in South Korea

To do so, the JS/J4, in partnership with the CCMDs and OSD, will assess the role of operational energy in existing campaign and contingency planning risk assessments (for instance in the Integrated Priority lists),

In partnership with the Combatant Commands (CCMDs) and OSD, the JS/J4, will assess the role of operational energy in existing campaign and contingency planning risk assessments.

[14] OECIF is a multi-year science and technology program which funds programs managed by the Services focusing on under addressed operational energy needs.
[15] 2014 QDR, p 25.

identify additional risks, and, where appropriate, make additions or improvements to risk assessment methodologies. The resulting list of specific risks will be continuously reviewed using established recurring review cycles to inform oversight and coordination of mitigations during annual PPBE cycles, as well as through the DOEB.

Goal: Improve Energy Supportability of Concepts of Operation.

While operation plans represent a detailed approach to a specific mission, the Department also uses CONOPS along with other concept documents to explore and validate alternative means of employing military forces. For instance, the *2012 Joint Concept for Operational Access* articulates the need to consider a variety of basing options on land and sea to enable operations in contested environments.[16]

In partnership with the JS/J4, Combatant Commands, and the Military Departments, the ASD(EI&E) will identify the most mature concepts being considered across the Department, and lead the analysis of their energy supportability to complement other Department supportability analyses. Wargames, modeling and simulation tools, and focused analyses, to include Service initiatives sponsored and supported by OECIF, will be used to assess the effects of constrained logistics capacity, threats, and operational energy demand on the energy supportability of future CONOPS. The Department will then work with concept leads to evaluate and implement appropriate changes in doctrine, organization, training, materiel, leadership, personnel, facilities and policy. The DOEB will be the primary venue for overseeing this effort in coordination with the DoD Components.

Goal: Diversify Energy Supplies to Reduce Risk.

To date, Department efforts in this area have been three-pronged; first, the Department has pursued renewable energy opportunities at contingency bases that harvest energy at the point of use to minimize the burden of resupplying operational forces with liquid fuel. Second, the Department has conducted testing and certification of fuels and platforms to prepare for bulk purchases of cost competitive, drop-in alternative fuels for operational use. While current efforts are focused on biofuel blends for maritime operations, over the past five years the Department has tested and accepted a range of alternative fuels for use

USAF KC-135 refuels a Navy F/A-18 Super Hornet

The Department led a transition to use commercial specification fuels and infrastructure as much as possible in order to reduce cost and gain access to broader network of suppliers.

[16] Joint Concept for Operational Access, January 17, 2012, pp 19-20; http://www.defense.gov/pubs/pdfs/JOAC_Jan%202012_Signed.pdf.

across the full range of air, sea, and ground platforms. Using specific Defense Production Act authorities, the Department also funded the construction of biofuel refining capacity in CONUS.[17] Finally, as appropriate to the mission, the Department used commercial specification fuels and infrastructure to reduce cost and gain access to a broader network of suppliers, consistent with the Department's policy to minimize the types of fuel required on the battlefield in order to increase standardization, flexibility, and interoperability.

Looking ahead, the Department will use identified deliberate planning and CONOPS risks to guide the assessment and prioritization of alternatives to petroleum-based fuels. These opportunities will then inform recurring PPBE oversight of Service investments, as well as coordination and collaboration at the DOEB. In addition, the Department will continue to test, certify, and seek the procurement of bulk volumes of cost competitive, drop-in alternative fuels, as well as continue to integrate alternative energy sources, primarily solar, into contingency bases and individual warfighter equipment.

Finally, the Department will examine opportunities to increase the use of "energy harvesting" technologies that collect energy from the environment or surrounding area in order to reduce the need for resupply. These may include solar or kinetic-powered devices for the individual warfighter, solar powered UAVs, waste-to-energy, and other technologies that enable the utilization of locally available energy.

Objective 3: Enhance Mission Effectiveness of the Current Force.

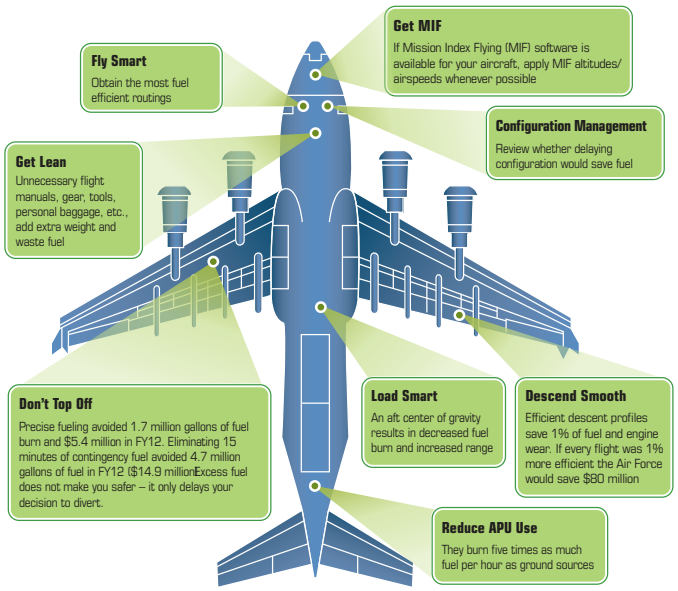
As set forth in the 2011 *Operational Energy Strategy*, the Department also understands the importance of improving energy use in combat and peacetime missions carried out around the globe every day. The Department will pursue a range of materiel and non-materiel initiatives that improve energy use in the near-term. As appropriate, priority will be given to near-term initiatives that improve the robustness and flexibility of the energy supply chain, enhance the ability to operate in contested environments, and support the rebalance to the Asia-Pacific region.

Goal: Upgrade Current Equipment to Improve Energy Use.

The range of improved contingency base equipment being fielded and deployed by the Services demonstrates now that new and improved equipment can make a dramatic difference in the risks of resupplying small isolated bases. Likewise, improving energy use through drag reduction on ships and aircraft can yield incremental increases in range, payload, or time on station.

[17] DoD policy for alternative fuels can be found in DoD Instruction 4140.25, DoD Management Policy for Energy Commodities and Related Services, June 25, 2015; http://www.dtic.mil/whs/directives/corres/pdf/414025p.pdf.

To improve mission effectiveness in the near-term, the Department will continue to field new equipment and enhancements to current equipment and platforms.[18] The Department will continue to place emphasis on improvements to current equipment types that consume significant amounts of energy, have significant remaining service life, and are fielded in sufficient quantity. Through existing mechanisms like the annual PPBE process and the DOEB, OSD and the Joint Staff will review Department investments in improvements to the current force.



Air Force initiatives to improve energy use in airlift and tanker aircraft.

Goal: Improve Energy Behavior.

> To improve mission effectiveness in the near-term, the Department will continue to field new equipment as well as enhancements to current equipment and operating procedures.

The Department acknowledges the potential benefits of changed behavior on day to day energy use; however, a significant barrier to improving tactics, techniques, and procedures (TTPs) is a limited understanding of the Department's use of energy and the operational implications of that energy use on the warfighter. For example, while the Department's understanding of its operational energy consumption has improved significantly since 2012, our understanding of energy use by ground forces has lagged. Once the risks and opportunities associated with energy use are understood, Service members will need the training, education, and policy support to make real-time changes in how Joint forces operate around the globe.

Accordingly, the Department will continue to close gaps in our understanding of energy use and the overall supply chain. This includes improving the fidelity of energy information available to commanders and planners that accounts for energy use across all types of equipment. The Department will continue to improve decision-support tools, dashboards, and routing and planning tools that enable Service members to use this information while in the field. In addition, the Department will include and monitor the role of operational energy in training and exercises, and build on existing elective courses to integrate operational energy considerations (i.e., the relationship between energy use, combat capability, and operational success) into core professional military education curricula on acquisition, strategy, logistics, and campaign planning.

[18] Near-term is defined as being fielded in the President's Budget year and/or one year after. For the FY 2017 President's Budget, near-term includes FYs 2017-18.

IMPLEMENTATION

Implementing the 2016 *Operational Energy Strategy* will be guided by specific initiatives associated with each goal. These targets and associated Offices of Primary Responsibility (OPRs) are summarized in Table 1.

Objectives	Goals	Targets	OPRs
Increase Future Capability	Institutionalize Energy Supportability Analyses in Capability Development	▪ By end of FY 2016, ensure all acquisition programs that use operational energy and are designated as Joint Requirements Oversight Council (JROC) Interest Items by the Joint Staff have an ESA-informed eKPP. ▪ By the end of FY 2018, ensure ESAs are used in all acquisition programs that use operational energy and were established in FY 2016 and later.	▪ Joint Staff ▪ Services
	Improve Combat Effectiveness and Supportability	▪ By end of FY 2018, increase energy supportability, as measured against current capabilities, in 100% of all new acquisition programs.	▪ Services ▪ Joint Staff
Identify and Reduce Risks	Identify and Mitigate Energy Related Risks in Deliberate Planning	▪ By end of FY 2017, review OE risks in campaign and contingency plans as part of established DoD review cycles. ▪ By the end of FY 2018, mitigate or accept 100% of identified OE risks.	▪ Joint Staff ▪ Services ▪ CCMDs ▪ OSD
	Improve Energy Supportability of Concepts of Operation	▪ By end of FY 2016, identify CONOPS with OE implications. ▪ By end of FY 2017, assess energy supportability and OE vulnerabilities of all identified CONOPS. ▪ By end of FY 2017, include OE constraints and limitations analyses in all Title 10 wargames.	▪ OSD ▪ Joint Staff ▪ Services
	Diversify Energy Supplies to Reduce Risk	▪ By end of FY 2016, review Department's capability to test and certify drop-in alternative fuels in pace with emerging technologies. ▪ By end of FY 2016, assess opportunities and risks related to expanded use of commercial petroleum products and infrastructure. ▪ By end of FY 2017, identify opportunities for harvesting energy from the surrounding environment in CCMD operations.	▪ OSD ▪ CCMDs ▪ Services ▪ DLA
Enhance Current Mission Effectiveness	Upgrade Current Equipment to Improve Energy Use	▪ By end of FY 2016, establish a recurring assessment of opportunities to increase the energy supportability of current equipment with extensive remaining service lives.	▪ OSD ▪ Services
	Improve Energy Behavior	▪ By end of FY 2016, assess improvements needed in energy information systems to increase supply chain visibility. ▪ By end of FY 2018, measure OE consumption by type of equipment. ▪ By end of FY 2018, include OE principles in required PME courses on strategy, logistics, and campaigning, as well as in general military training within the DoD.	▪ Services ▪ Joint Staff ▪ DLA

Table 1: Targets for the 2016 Operational Energy Strategy

Progress against these targets will be reviewed using existing mechanisms, including the annual PPBE cycle, Joint Requirements Oversight Council, Defense Acquisition Board process, and DOEB. Notably, the strategy does not include specific energy reduction targets; operational requirements and needs of the Joint force should define our objectives, not just reductions in energy use. However, as investments are prioritized for research, new equipment, and upgrades, the Department is cognizant that areas of greater consumption likely will yield more opportunities for improvement.

CONCLUSION

Since the inaugural Operational Energy Strategy in 2011, the Department has made tremendous strides in refining our use of energy at contingency bases, adapting our requirements and force development process, and establishing operational energy policy and oversight across the Services, Combatant Commands, and the Department overall. Reflecting the essential role of operational energy in warfighting as well as the liabilities of that dependence through the threats to its assured delivery, the 2016 Operational Energy Strategy builds on these successes and identifies a comprehensive set of initiatives to improve future capability, reduce risk, and enhance current mission effectiveness. Together, these will lighten the logistics footprint, ensure uninterrupted operations in contested environments, and better inform Department decision-making across planning, programming, requirements, acquisition, budgeting, execution, and operational planning.

OPERATIONAL ENERGY STRATEGY

- Increase future warfighter capability
- Identify and reduce risk
- Enhance current mission effectiveness

An HC-130J Combat King II conducts an aerial refueling mission.

Back image (top): A U.S. Marine with 1st Marine Division, 1st Tank Battalion, Delta Company, refuels a M1A1 Abrams tank at the fuel farm in Helmand province, Afghanistan, Feb. 2. The Delta Company will support the International Security Assistance Force throughout the area of operations. (U.S. Marine Corps photo by Staff Sgt. Brian Lautenslager)

Back image (bottom): Specialist Dustin Atkins, CH-47 Chinook crew chief assigned to Company B, 2nd Battalion, 501st Aviation Regiment, 1st Armored Division, Task Force Iron Knights, from Fort Bliss, Texas, rushes to set up a forward arming refuel point to refuel a UH-60 Black Hawk, Dec. 21, 2014, Tappita, Liberia. Atkins and a team of crew chiefs set up a forward arming refueling point from their CH-47 Chinook to ensure the commander of Joint Forces Command - United Assistance and crew made it to Ebola treatment unit sites throughout Liberia. United Assistance is a Department of Defense operation in Liberia to provide logistics, training and engineering support to U.S. Agency for International Development-led efforts to contain the Ebola virus outbreak in western Africa. (U.S. Army photo by Spc. Rashene Mincy, 55th Signal Company)

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